HP SureStore 80ex Optical Jukebox

User's Guide

Edition 1

HP Part No. C1100-90015

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Printing History

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Typographical Conventions

The following typographical conventions are used in this manual:

Emphasis: Denotes important information.

Keycap: Keys on the library.

`Computer Output`: Information displayed in the display window and screen menu items that you can select.

WARNING **Warnings call attention to a procedure or practice that could result in personal injury if not correctly performed. Do not proceed until you fully understand an meet the required conditions.**

CAUTION Cautions call attention to an operating procedure or practice that could damage the product if not correctly performed. Do not proceed until understanding and meeting these required conditions.

NOTE Notes provide information that can be helpful in understanding the operation of the product.

In This Manual

This user's guide includes:

Chapter 1	set-up information for the HP SureStore Optical 80ex optical jukebox
Chapter 2	information about choosing and using optical disks
Chapter 3	features description, operating instructions, and troubleshooting information
Appendix A	supplies and customer support
Appendix B	operating this jukebox on a SCSI bus
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1 Setting up the Jukebox

Setting Up the Optical Jukebox

This chapter tells you how to connect the jukebox to your computer. Follow the unpacking instructions printed on the outside of the shipping carton before you complete the steps given in this chapter.

This chapter gives information on the following topics:

- choosing a proper environment for the jukebox
- identifying parts on the rear panel
- connecting the jukebox to your computer
- connecting power
- moving and shipping the jukebox

What you need for setting up the jukebox:

- power cord (included)
- SCSI terminator (included)
- 50-pin low-density SCSI cable
- single-ended SCSI host adapter with at least one available address
- application software that supports this type of jukebox
- this guide (included)

Choosing a Location

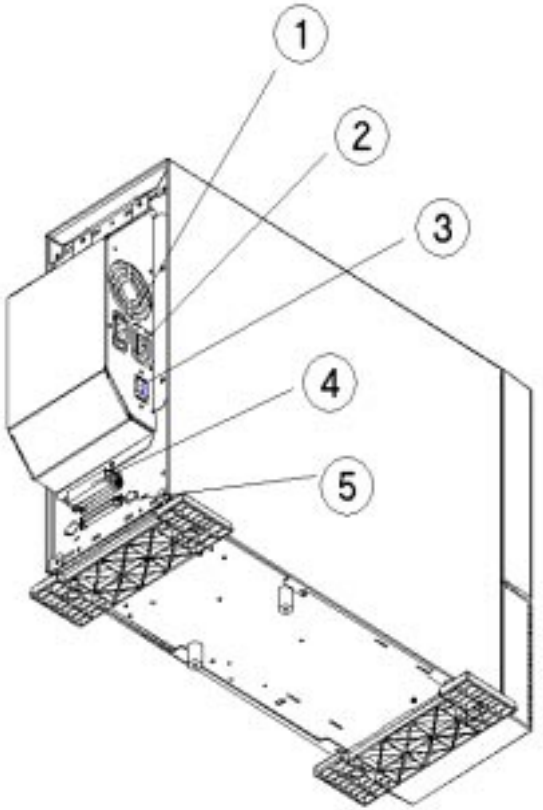
Before setting up your jukebox, choose the proper environment based on the following recommendations:

- temperature range between 65-75º F (18-24º C).
- away from sources of particulate contamination such as printers, scanners, frequently-used doors and walkways, supplies that collect dust, and smoke-filled rooms.
- 2-3 inches in front and back of the jukebox to allow air circulation.
- availability of AC power with voltage ranges of 90-127 V (115 V nominal) or 198-250 V (230 V nominal).

Identifying Rear Panel Features

Refer to Figure 1-1 and the text on the next page to identify parts and learn their functions.

Figure 1-1 **Rear Panel Features**



The numbers below correspond to the numbers in Figure 1-1 on the previous page.

1	Power receptacle	Used to connect the power cord to the jukebox.
2	Auxiliary power port	Used for auxiliary power connections. Do not use for connections requiring over 3 amperes of power.
3	Power switch	Switches power on and off to the jukebox.
4, 5	SCSI ports	Two 50-pin low-density connectors (Centronics-type) that allow connection to a SCSI bus and for daisy-chaining to other devices. A terminator must be plugged into one of these connectors when the jukebox is the last physical device on a SCSI bus. A terminator is shown plugged into the “4” connector.

Removing the Mailslot Shipping Bracket and Shipping Screw

The jukebox is shipped with a plastic bracket inserted into the mailslot. In addition to protecting the mailslot during shipment, the bracket also holds a warning decal reminding you to remove the shipping screw on the bottom of the jukebox.

To remove the mailslot bracket and shipping screw, refer to Figures 1-2 and 1-3 and do the following:

1. Grasp both sides of the bracket and at the same time hook your fingers underneath its lower edge.
2. Gently bend the bottom of the bracket out slightly and while jiggling the bracket, pull it out from the mailslot.
3. Lay the jukebox on its side and unscrew the shipping screw. The screw has a knurled top so removing the screw can be done by hand.

NOTE The jukebox will not be harmed by laying it on its side.

Figure 1-2 **The Mailslot Shipping Bracket**

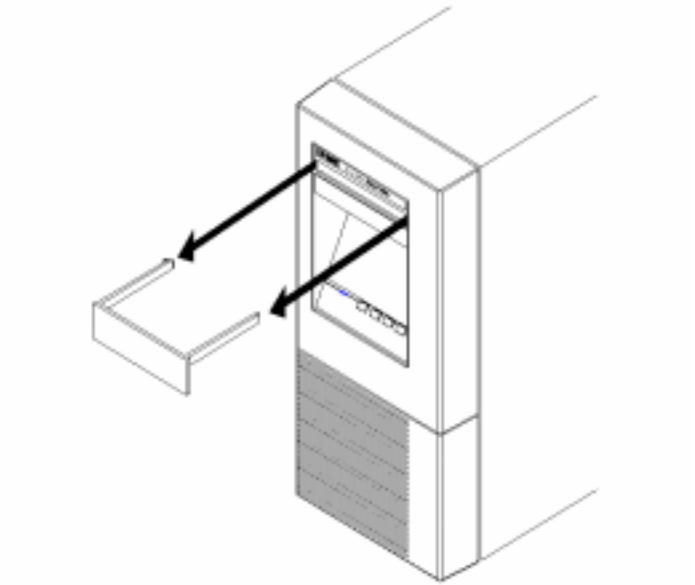
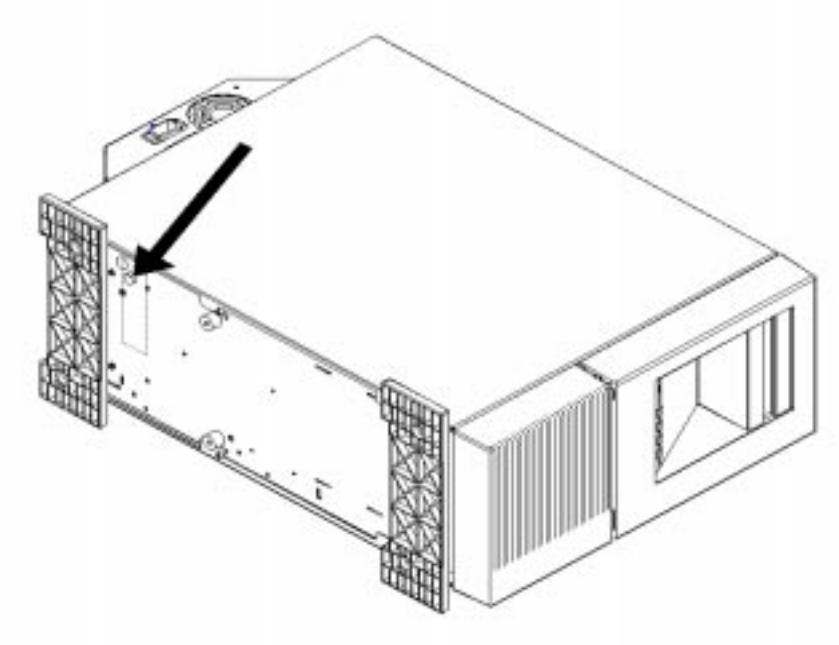


Figure 1-3 Location of the Shipping Screw



Connecting the SCSI Cable to the Jukebox

The jukebox accepts a single-ended SCSI bus. The connectors are low-density 50-pin (Centronics type).

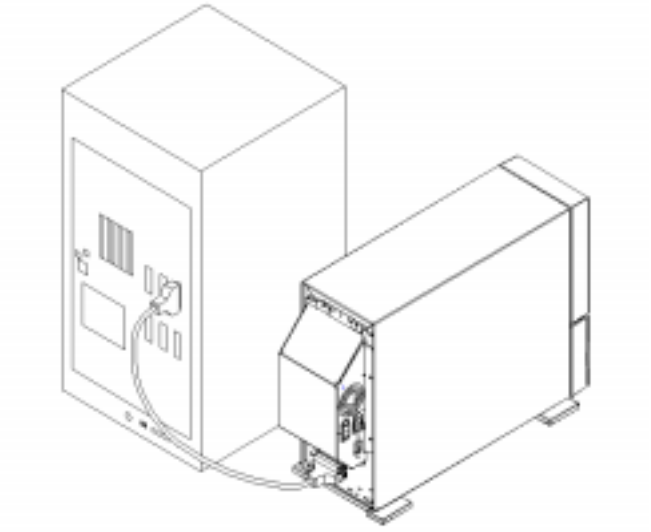
The drives are “fast” SCSI so you have a maximum of 3 meters (9.8 feet) available for the SCSI bus. The jukebox uses 1.5 meters (4.9 feet) of of this bus internally. This leaves 1.5 meters (4.9 feet) for the remainder of the bus.

Your jukebox can be connected to your host computer in two ways:

- as the only SCSI peripheral on a bus
- as one of multiple SCSI peripherals on a bus (not recommended)

Connecting the Jukebox as the Only Peripheral

Figure 1-4 **Connecting the Jukebox as the Only Peripheral**



The default IDs for the jukebox are as follows:

Jukebox = 3

Drive 1 = 4

Drive 2 = 5 (if installed)

1. Ensure that the mailslot shipping bracket and the shipping screw are removed.
2. Ensure that your host computer and your jukebox are OFF.

   The jukebox power switch is OFF when the switch is raised (out).
3. Connect a SCSI cable between one of the SCSI ports on the jukebox with a SCSI port on your host computer (see “4” or “5” on Figure 1-1).
4. Plug a terminator into the unused SCSI port on the jukebox.

   Because this configuration makes the jukebox the last peripheral on the SCSI bus, the bus must be terminated on the jukebox. The jukebox ships with a terminator plugged into one of its SCSI ports for your use.

Connecting the Jukebox with Other SCSI Peripherals

In most circumstances, the recommended configuration for this jukebox is as the only device on a SCSI bus. However, your use of the jukebox may be such that another device could be connected to the bus without a loss of performance.

There are many issues that must be considered when connecting another devices on the same bus with this jukebox such as the following:

- How the jukebox is used; archiving, backup, near-line storage. What performance must be maintained
- How the additional peripheral will be used. How much demand will it place on the bus
- Bus length available.

If you would like a review of SCSI and a discussion of the issues involved with connecting devices on a bus, refer to Appendix B of this guide.

Connecting Power

1. Ensure that the mailslot shipping bracket and the shipping screw are removed (see Figures 1-2 and 1-3).
2. Ensure that your host computer and your jukebox are OFF.

   The jukebox power switch is OFF when it is OUT.
3. Plug the socket end of the power cord into the power port on the rear of the jukebox (see "1" on Figure 1-1). Use the power cord supplied with the jukebox.
4. Plug the other end of the power cord into an electrical outlet.
5. Press the power switch (see "3" on Figure 1-1).
6. Initially, `TESTING` appears in the display window on the front of the jukebox. Once the poweron test completes (approximately 1.5 minutes), `READY` displays. (See "Understanding Display Window Messages" in Chapter 3 for additional information about the displayed messages.

NOTE

If `FAIL 1` displays, the poweron test was not successful. Ensure that the shipping screw is removed (see page 1-7). If the shipping screw was removed, refer to "Troubleshooting" in Chapter 3.

Moving or Shipping the Optical Jukebox

To move the jukebox a short distance, such as to another office or to another floor in your building, refer to “Moving the Jukebox”. To ship the jukebox to another location, refer to “Shipping the Jukebox”.

Moving the Jukebox a Short Distance

1. Unmount any optical disk surfaces in the jukebox if necessary.

   See your computer operating system, or software application documentation for instructions on how to unmount optical disks.

2. Ensure that there are no disks in the drives.

   Eject any disks as necessary. Refer to your jukebox application software documentation. If you will be manually ejecting disks, refer to “Ejecting an Optical Disk from the Jukebox” on page 3-10.

CAUTION Failure to eject a disk from the optical drive prior to moving the jukebox could result in damage to the optical drive mechanism.

CAUTION Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

3. Switch jukebox power OFF (see “3” on Figure 1-1). The power switch is OFF when it is out.
4. Remove the power cord and the SCSI cable connections from the rear of the jukebox.
5. Carefully move the jukebox to its new destination. If the jukebox contains disks, do not tip the jukebox or lay it on its side.
6. Set up the jukebox at its new location, following the procedures in the beginning of this chapter.

Shipping the Jukebox

1. Unmount any optical disk surfaces in the jukebox if necessary.

   See your computer operating system, or software application documentation for instruction on how to unmount optical disks.

2. Eject all disks from the jukebox.

   If you will be replacing the disks into this jukebox after shipment, it is recommended that you label the disks at this time to at least show their slot location inside the jukebox. This will aid the setup at the new location.

   Refer to your jukebox application software documentation for instructions on how to eject disks from the jukebox. If you will be manually ejecting disks, refer to "Ejecting an Optical Disk from the Jukebox" on page 3-13. To label disks so that the *labeling will not cause problems* in the jukebox, refer to "Labeling an Optical Disk Cartridge on page 2-4 in Chapter 2.

CAUTION Failure to eject a disk from the optical drive prior to moving the jukebox could result in damage to the optical drive mechanism.

Failure to remove all disks from the storage slots in the jukebox could result in damage to the jukebox.

CAUTION Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

3. Switch jukebox power OFF (see "3" on Figure 1-1). The power switch is OFF when it is out.

   The disk transport mechanism will lower to the chassis when power is turned off. The position at the bottom of the chassis is correct for insertion of the shipping screw.

4. Remove the power cord and the SCSI cable from the jukebox rear panel (see "1" and "4" or "5" on Figure 1-1).

5. Secure the mailslot by inserting the mailslot shipping bracket. Refer to page 1-6 for a description of this bracket.

   The slides into the mailslot easily, but will not latch. Place a piece of tape across the bracket to keep it in place.

6. Re-insert the shipping screw that was removed when the jukebox was unpacked. This screw is 6/32 UNC-2B cap screw 1 3/4 inches long. Re-install in the position shown in Figure 1-3.
7. Repack the jukebox in its original shipping carton.

   An alternative method of shipping is careful packaging and padded van shipping.

2 Using Optical Disks

Overview of This Chapter

Using Optical Disks

The optical disks that you use with your jukebox are an integral part of the storage process. This chapter provides information on the following topics:

- choosing an optical disk type
- labeling optical disks
- write-protecting optical disks
- caring for optical disks

NOTE

The optical cartridges used in this jukebox are a critical part of reliable data storage.

Optical cartridges consist of an opto-magnetic medium and mechanical components. Consistent quality of opto-magnetic media ensures correct “writes” and “reads.” The quality and fit of the mechanical components of the cartridge affect accurate, smooth handling of the cartridge by jukebox robotics. A failure of the mechanical components of a cartridge could damage the mechanism of an optical drive.

CAUTION

Use only HP-qualified media cartridges in this jukebox. Use of non-HP-qualified optical cartridges could damage an optical drive and void the warranty of that drive.

NOTE

A list of Hewlett-Packard optical media cartridges is in Table A-1 of Appendix A.

If you are not using HP media, please refer to the list of HP-qualified manufacturers on the website:

www.hp.com/isgsupport/optical/index.html

Choosing an Optical Disk Type

Two disk types are available for use in the jukebox: rewritable disks and write-once disks.

To choose which type of disks to use, consider these points:

- Rewritable optical disks--data can be repeatedly written and erased.
- Write-Once optical disks--data can be written only once, and the data cannot be altered or erased. If you have a need for data security and audit trails, write-once disks may be a good disk choice.
- Both rewritable and write-once disks come in three sector sizes: 2,048 bytes/sector, 1,024 bytes/sector, and 512 bytes/sector. The sector size you choose depends upon what type of operating system you have in your host computer and which software package you use to manage files stored on the jukebox.

NOTE

Do not use write-once disks in a computer system that does not support write-once disks. Check that your jukebox application software supports write-once disks.

Labeling an Optical Disk Cartridge

Make it a practice to label your optical disk cartridges. You are provided adhesive labels with each disk for this purpose. Here are some suggestions for labeling:

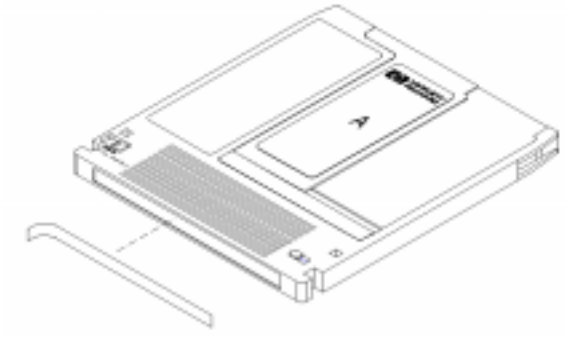
NOTE Your jukebox application software may label your optical disk slot locations differently. Use your application to check disk locations prior to labeling the disks.

- storage slot location (1, 2, 3, ...)
- date of format or initialization
- disk owner (group, department, etc.)
- storage purpose (backup, old version of operating system, etc.)

HP recommends using end labels as shown in Figure 2-1. End labels reduce the chance of label material interfering with the cartridge shutter and causing a drive to jam.

CAUTION Labels used in the vicinity of the shutter may cause the drive to jam if the label is installed incorrectly or if portions of the label lift off because of wear. If a drive jams because the label interferes with the shutter, a service call may be necessary.

Figure 2-1 Recommended Placement of Cartridge Labels



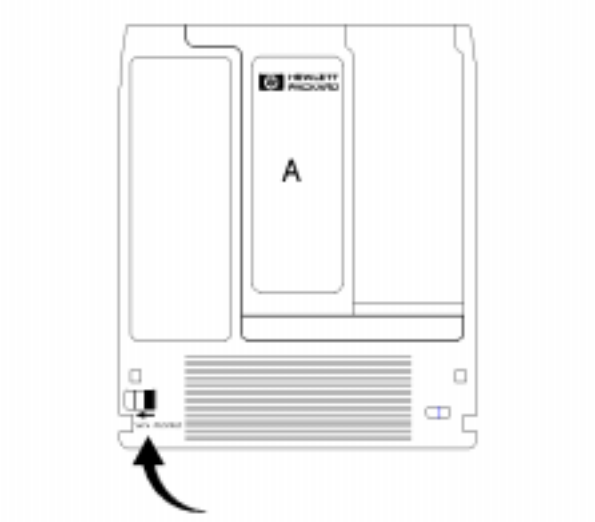
Write-Protecting an Optical Disk

Each side of an optical disk can be write-protected by sliding the write-protect button in the direction of the arrow on the cartridge (see Figure 2-2).

With rewritable optical disks, write-protecting the disk prevents overwriting existing files and prevents any additional file being written to the disk.

With write-once optical disks, existing files cannot be altered or erased regardless of whether or not the write-protect button has been set. However, setting the button to write-protect prevents writing additional files to the disk.

Figure 2-2 **Write-Protect Button Location**



Caring for Optical Disks

Follow these guidelines to ensure that your optical disks remain in good condition:

- Do not expose disks to extreme magnetic fields.
- Do not expose disks to dust particles.
- Do not expose disks to extreme temperatures or extreme humidity.
- Do not drop the disks.
- Do not open a disk's metal shutter and touch the disk surface.
- Do not take disks apart.
- Do not insert disks with loosely-attached labels into the jukebox.
- Remove old disk labels before applying new ones especially if you choose to place labels on the sides of the cartridge (near the shutter) rather than on the end of the cartridge.
- Store disks in a clean, safe place when they are not in use.

Cleaning Disks

Normally, an optical disk does not require cleaning when used in a computer room or clean office environment. If you are in an extremely dusty environment and are experiencing difficulties reading and/or writing to a particular disk you may want to clean the disk to see if this corrects the problem.

CAUTION

Be very careful when cleaning an optical disk. Abrasive particles dragged across the disk surface can damage the disk and prevent recovery of some or all of the data on the disk.

Clean a disk only with a disk cleaning kit. Follow the disk cleaning kit instructions exactly.

The order numbers for manual and automated disk cleaning kits are in Table A-1, Appendix A.

3 Operating the Jukebox

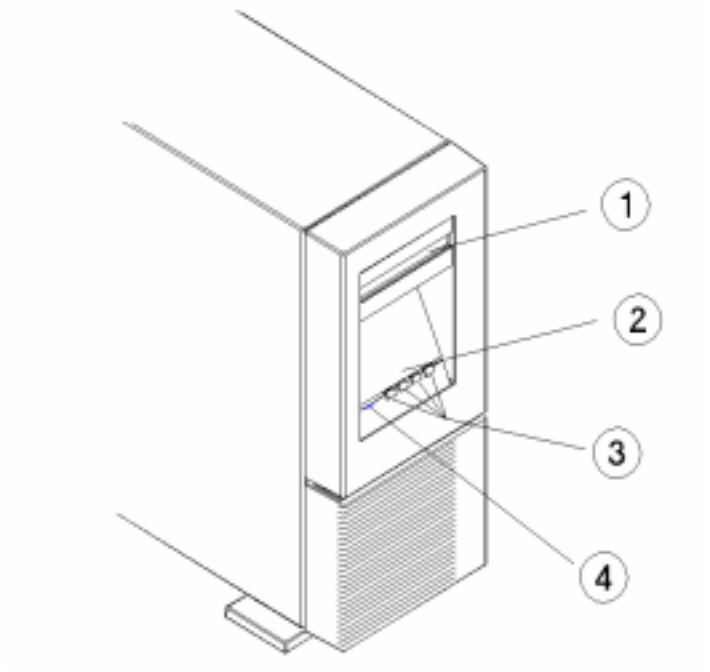
Overview of This Chapter

This chapter describes how to do the following:

- identify front panel features
- use selection buttons
- interpret displayed messages
- load optical disks into the jukebox
- eject optical disks from the jukebox
- set a security code
- change configurations
- retrieve internal jukebox performance information
- run tests (for service use only)
- set SCSI IDs

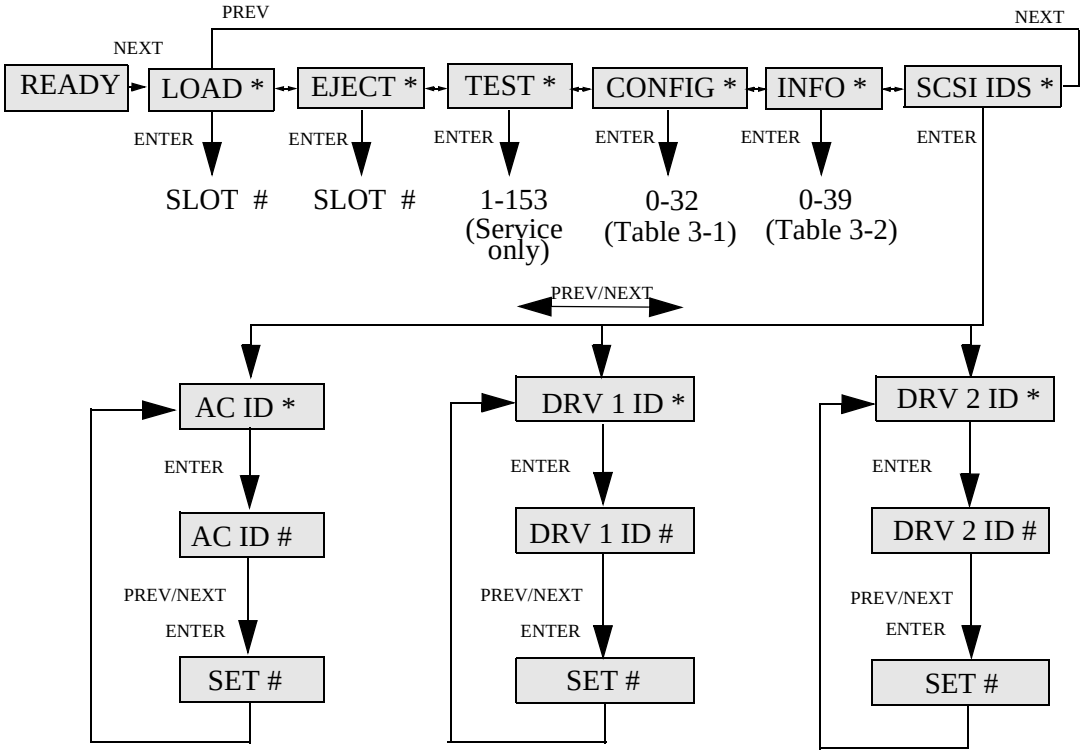
Indentifying Front Panel Features

Figure 3-1 **Features on the Front Panel**



1	Mailslot	Used to load and eject disks.
2	9-Character display	Displays information about the current operation.
3	Selection buttons	Pressed to perform the following operations: **CANCEL** cancels the current operation or choice **PREV** scrolls the displayed choice backward by one **NEXT** scrolls the displayed choice forward by one **ENTER** selects the displayed choice
4	Drive indicator	Lit when the optical drive mechanism is being accessed.

Figure 3-2 **Jukebox Display Menu Tree**



Using Selection Buttons

Use the **CANCEL**, **PREV**, **NEXT**, and **ENTER** buttons to select tasks you want the jukebox to perform. When you push these buttons, the message in the display window changes. See the next section for a list of messages.

Each time you push the **NEXT** or **PREV** button, a task option appears. (If you see an "*" as part of the message, it indicates there is a menu beneath that option, which you can access by pressing the **ENTER** key. To display additional options press the **NEXT** or **PREV** Key. If you hold the **NEXT** or **PREV** buttons down, the display scrolls faster.)

NOTE

You can get back to READY at any time by pressing **CANCEL**. (You may have to press **CANCEL** more than once in some cases.)

Understanding Display Window Messages

The jukebox displays messages according to your keypresses on the control panel. One level of messages is to tell you which operation you have selected, another level is to give you feedback to which options you are selecting under each operation.

Messages are also displayed that tell about operations that the host computer has initiated.

Messages During Operator Selections

The display window shows you the operations you may select. A description of each operation is given below. Instructions for using and setting operations are given in the following sections. (See the note below.

`READY` - the jukebox is ready for operation

`LOAD *` - select to load disks through the mailslot

`EJECT *` - select to eject disks through the mailslot

`TEST *` - select to run internal jukebox tests (tests are for service only

`CONF *` - select to customize the way the jukebox functions (CONFigurations)

`INFO *` - select to retrieve performance information

`SCSI ID *` - select to set the SCSI IDs for the jukebox controller and the optical drive mechanisms.

NOTE

An "*" indicates there are options that must be set with that operation. The next section explains how to use these operations.

Pressing **CANCEL** one or two times brings the jukebox back to the READY display.

Messages During Host Operations

Some disk operations initiated by the host computer will cause messages to be displayed. The following are examples of these messages.

`LOAD 15` - the host computer selected the disk in slot 15 for insertion into a drive

`MOVING` - the disk transport mechanism is moving a disk

`STORE 1` - the host computer selected slot 1 to store a disk

Using the Front Panel Features

This section gives step-by-step instructions for tasks that are accessed by using the selection buttons on the control panel.

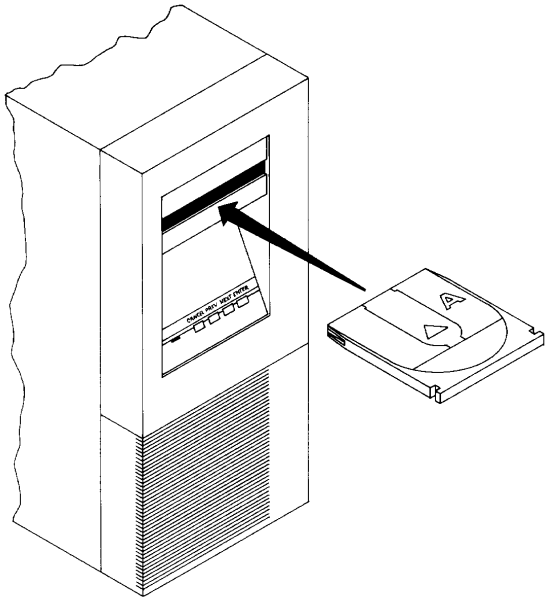
Tasks included in this section are:

- loading a disk into the jukebox
- ejecting a disk from the jukebox
- setting a security code
- changing a configuration option
- retrieving performance information
- running internal jukebox tests (at request of service)
- changing the jukebox controller SCSI ID
- changing a drive SCSI ID
- troubleshooting

Loading an Optical Disk Into the Jukebox

Label all disks before inserting them into the jukebox. (See "Labeling an Optical Disk Cartridge" in Chapter 2 for instructions.)

Figure 3-3 **Loading a Cartridge**



NOTE Some software packages require that you insert and remove disks by following the instructions in the software. If you are using a software package to manage files in the jukebox, check the software documentation before proceeding with these steps.

Start with READY *in the display.*

1. Insert a cartridge into the mailslot; shutter end of the cartridge first, Side A facing up (see Figure 3-3). Push the cartridge in firmly but gently until it is fully inserted into the mailslot. SLOT ## displays ("##" is the number of an available storage slot, 1 to 16, in the jukebox).
2. If the displayed storage slot number is the one you want, press **ENTER**. If you want to choose a different storage slot, press **NEXT** until the desired slot number is displayed and then press **ENTER**.

3. After the disk has been loaded into the selected storage slot, READY displays.

Ejecting an Optical Disk From the Jukebox

Start with READY *in the display.*

1. Press **NEXT** until EJECT * displays.
2. Press **ENTER**. SLOT ## displays. ("##" is a slot number from 1-16 where a disk is stored.

   DRIVE # may also display, indicating there is a disk in a drive.)
3. If the number of the slot (or drive) that is displayed is the one you want, press **ENTER**.

   If you want a different numbered slot (or drive), press **NEXT** or **PREV** until that number displays. Then press **ENTER**.

Setting a New Security Code

The security code 0 0 0 is set at the factory. This code is used when accessing and setting jukebox configurations. Consider changing the security code so that only authorized persons can change the configurations.

NOTE

Don't forget your security code. If you forget it, only your service representative can reset the security code to the factory setting so you can set a new code.

Start with READY *in the display.*

1. Press **NEXT** until CONF * displays
2. Press **ENTER**. CONF 0 and a flashing 0 displays.
3. Press **NEXT** until CONF 17 displays.

   Starting from when you press **ENTER** in the next step, you are prompted to enter the current security code.
4. Press **ENTER**. CODE 1 and a flashing 0 displays.
5. Press **NEXT** until the first number of your current security code displays.
6. Press **ENTER**. CODE 2 and a flashing 0 displays.
7. Press **NEXT** until the second number of your current security code displays.
8. Press **ENTER**. CODE 3 and a flashing 0 displays.

9. Press **NEXT** until the third number of your current security code displays.
10. Press **ENTER**.

    If you entered an incorrect code, `NO CONFIG` displays briefly and then `CONF 17` displays. Repeat steps 4-10 again and enter the correct current code.

    After entering the current security code in the previous steps, you are prompted to enter a new three-digit security code.
11. Press **ENTER**. `NEW 1` and a flashing `0` displays.
12. Press **NEXT** until the first number you want in your security code displays
13. Press **ENTER**. `NEW 2` and a flashing `0` displays.
14. Press **NEXT** until the second number you want in your security code displays.
15. Press **ENTER**. `NEW 3` and a flashing `0` displays.
16. Press **NEXT** until the third number you want in your security code displays.
17. Press **ENTER**. `SET 17` displays briefly.
18. Press **CANCEL** to return to `READY`.

CAUTION

The next step is to turn off the jukebox.

Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

19. Turn the jukebox OFF, then ON to save the code to the jukebox flash ROM.

NOTE

You can limit access to your jukebox by setting certain security options. See Table 3-1 for information about configurations 15, 20 and 31.

Customizing the Operation of the Jukebox

You can customize the way the jukebox operates by setting values in its “configurations.”. See Table 3-1 for a list of these configurations, their default settings, and possible settings.

NOTE

Your security code is required to change configurations 15, 17, 20, and 31.

Some configurations require your security code. See “Setting a Security Option” for steps to change configurations 15, 17, 20 and 31.

Changing a Jukebox Security Configuration

Configurations that affect security of your disks in the jukebox are numbered 15, 17, 20, and 31. Table 3-1 describes these configurations.

During the process of setting the security configurations, you are prompted for your current security code. If you have not changed the default security code, enter 0-0-0. If you have changed the security code to a different set of three digits, enter your code. Setting a security code is described in “Setting a New Security Code” explained previously.

Follow these steps to set a security option

Start with READY *in the display.*

1. Press **NEXT** until CONF * displays.
2. Press **ENTER**. CONF 0 displays. (The 0 is flashing.)
3. Press **NEXT** until the number of the option you want to change displays.
4. Press **ENTER**. CODE 1 and a flashing 0 displays.
5. Press **NEXT** or **PREV** until the first number of your security code displays.
6. Press **ENTER**. CODE 2 and a flashing 0 displays.
7. Press **NEXT** or **PREV** until the second number of your security code displays.
8. Press **ENTER**. CODE 3 and a flashing 0 are displayed.
9. Press **NEXT** or **PREV** until the third number of your security code displays.

   NO CONFIG displays if you entered the wrong security code.
10. Press **ENTER**. Choose the option number you want by pressing **NEXT** or **PREV**.
11. Press **ENTER**. OFF or ON displays. Choose the option you want and press **ENTER**. SET displays briefly. The security option is set.
12. Press **CANCEL** two times to return to READY.

CAUTION

The next step is to turn off the jukebox.

Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for

information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

13. Turn the jukebox OFF, then ON to save the code to the jukebox flash ROM.

Setting Non-Security Configurations

Start with READY *in the display.*

1. Press **NEXT** until CONF * displays.
2. Press **ENTER**. CONF 0 and a flashing 0 displays.
3. Press **NEXT** until the number of the option you want to change displays. NO CONFIG displays if you choose an invalid number.
4. Press **ENTER**.

   The current default setting displays. It may be any one of these settings

   - OFF or ON
   - a number
5. Select the option you want by pressing **NEXT** or **PREV**.
6. Press **ENTER**. SET displays.
7. Press **CANCEL** to exit.

CAUTION

The next step is to turn off the jukebox.

Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

8. Turn the jukebox OFF, then ON to save the code to the jukebox flash ROM.

Table 3-1 Configurations

Number	Function	Default	Settings
0-14	*Used by service personnel only. Changing these configurations may result in an inoperable jukebox.*		
15	Enables or prevents manual disk removal.	Off	On - disks cannot be loaded or ejected. Off - disks can be loaded and ejected. Requires entering the current security code.
17	Set a new security code.	0-0-0	Any three-digit number. Requires entering the current security code.
18	*Used by service personnel only. Changing this configuration may result in an inoperable jukebox.*		
20	Set disk security operation after a power failure	Off	On - maintains the status of config. 15 upon power cycle or power failure. Off - config. 15 is not maintained through a power cycle or power failure. Requires entering the current security code.
21-26	*Used by service personnel only. Changing these configurations may result in an inoperable jukebox.*		
27	Reporting recovered errors to the host computer	Off	On - reports the SCSI- level error to the host computer. Off - no reports of SCSI- level errors to the host computer.
28-30	Not used		

Number	Function	Default	Settings
31	Enabling/disabling mailslot access.	Off	Off - Normal mailslot operation. On - The mailslot rotates to face inward when Configuration 15 is set to ON or a Prevent Media Removal command is received from the host computer. The mailslot remains facing inward until configuration 15 is set to OFF or an Allow Media Removal command is received from the host computer. If the jukebox is full, the mailslot will rotate and allow a disk to be ejected when the jukebox receives an EJECT command from the host computer. Requires entering the current security code.
32-39	Not used		
40	*Used by service personnel only. Changing these configurations may result in an inoperable jukebox.*		
41	Forces the optical drive to execute a verify after every write	ON	ON - Write verify is forced. OFF - The drive may write verify or not, depending on how they are manually configured or how they are configured by the jukebox application software.
42-65	Not used		
66	*Used by service personnel only. Changing these configurations may result in an inoperable jukebox.*		

Retrieving Information Logged by the Jukebox

You can display information about the operations of the jukebox by using the `INFO *` option. This information is called a log. See Table 3-2 for a list of logs.

Start with `READY` *in the display.*

1. Press **NEXT** until `INFO *` appears in the display window.
2. Press **ENTER**. A flashing `0` displays
3. Press **NEXT** until the desired log number displays.
4. Press **ENTER**. If you select any log except 4 or 16 (the drive logs), the log information displays. If you are in logs 4 or 16, `DRIVE 1` displays and you can press **ENTER** for Drive 1 information. If your jukebox has two optical drives, you can press **NEXT** (`DRIVE 2` displays) and **ENTER** to access Drive 2 information.
5. Press **ENTER** to stop the `INFO *` display
6. Press **ENTER**, then **NEXT** to choose another log.
7. Press **CANCEL** to return to `READY`.

Table 3-2 Information Logs

No.	Description
1	Firmware revision of the jukebox
4	Total cartridge loads for the drive.
5	Operation hours (power on time)
9	Total moves and move attempts by the disk transport mechanism.
12	Total disk transport mechanism flips.
14	Total mailslot rotations.
16	Optical drive SCSI ID.

NOTE Additional log numbers not listed in Table 3-2 provide information that is used by authorized service personnel.

Running an Internal Test

The jukebox is capable of running internal tests. These tests are used for service diagnostic purposes. You may be asked to run some tests by the service representative prior to coming to your site. Results of the tests can provide service with important information that can help service to more quickly resolve the problem in your jukebox.

CAUTION

Some internal tests can corrupt your file system. Unless directed by an authorized service representative, do not run jukebox internal tests

Changing SCSI IDs

The jukebox controller uses two SCSI IDs if your jukebox has one drive and three IDs if your jukebox has two drives. The jukebox controller is assigned one ID and one ID is assigned to each disk drive.

The default SCSI IDs are as follows

- jukebox controller = 3
- disk drive 1 (lower drive) = 4
- disk drive 2 (upper drive in a two-drive model) = 5

If you are already using one of these IDs for your computer or another SCSI peripheral device, follow the directions in one of the next two sections to change either the jukebox controller or a drive ID.

Changing the Jukebox Controller ID

Start with READY *in the display.*

1. Press **NEXT** until SCSI ID * displays.
2. Press **ENTER**. AC ID * displays. ("AC" is the "jukebox controller.")
3. Press **ENTER**. AC ID 3 displays.
4. Press **NEXT** or **PREV** until the ID you want displays.
5. Press **ENTER**. SET # (# is a number from 0-7) displays briefly and then AC ID * displays again. The ID you chose is now set.
6. Press **CANCEL** two times to return to the READY state.

NOTE CONFLICT displays if you attempt to set the jukebox controller and a drive to the same ID. Repeat the procedure and reset one of the IDs to another, non-conflicting ID.

NOTE After you change an ID you may have to restart your host computer for the new ID to be recognized.

CAUTION Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

Changing an Optical Drive ID

Start with READY *in the display.*

1. Press **NEXT** until SCSI ID * displays.
2. Press **ENTER**. AC ID * displays. ("AC" is the "jukebox controller.")
3. Press **NEXT** until DRV 1 ID * or DRV 2 ID * (if your jukebox has two drives) displays.
4. Press **ENTER**. DRV # ID? displays, where "#" is the number of the drive you selected in step 3 and "?" is the ID to which your selected drive is currently set.
5. Press **NEXT** until the ID you want displays.
6. Press **ENTER**. SET # (# is a number from 0-7) displays briefly and then DRV # ID # displays again. The ID you chose is now set.
7. Press **CANCEL** two times to return to the READY state.

NOTE CONFLICT displays if you attempt to set the jukebox controller and a drive to the same ID. Repeat the procedure and reset one of the IDs to another, non-conflicting ID.

NOTE After you change an ID you may have to restart your host computer for the new ID to be recognized.

CAUTION Do not turn off power to the jukebox until you are sure the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. Check your host system manuals for information about checking the SCSI bus status. If your computer is connected to a LAN, be sure to check with your system administrator before turning off power to the jukebox.

Troubleshooting

This section provides steps you can take when problems occur during operation. To troubleshoot problems, first refer to the procedures in this troubleshooting section. If these procedures do not correct the problem, check the HP web site at www.hp.com/isgsupport/optical/index.html and the other support services listed in Appendix A.

NOTE

If a service call is necessary, gather the following information before calling:

- model of your jukebox
- serial number
- brand and model of your host computer
- brand and model of your host computer SCSI adapter
- jukebox application software you are using and its version
- any jukebox driver separate from your jukebox application software and the version of this driver

Table 3-3 Troubleshooting

Problem	What to do
Jukebox won't power on	• Check that the power indicator light on the drive front panel is ON ("3" on Figure 3-1). • If light is not ON, make sure the power switch on the rear panel is ON and that the jukebox is plugged in. • Is the power cord good? • Is the power outlet operating? • If steps above are unsuccessful, refer to Appendix A for service numbers.
Poweron selftest failed	• Ensure that shipping screw is removed. • Ensure that the shipping bracket (in the mailslot) is removed. • Power cycle the jukebox. (See the note at the bottom of this page.) If jukebox continues to fail poweron selftest, press **ENTER** and record the error codes. Call your service representative.
Power to the jukebox failed while a disk was in the drive and did not return to READY after the power came back on	• Power cycle the jukebox. (See the note below.) If the poweron test is unsuccessful, place the power switch to OFF. Do not move the jukebox! Moving the jukebox when there is a disk cartridge inside the drive risks damaging the drive. Call your service representative.
Before turning power OFF, ensure that the SCSI bus is inactive and will remain inactive while you are troubleshooting. Turning power OFF in this jukebox while the SCSI bus is active can cause data loss and/or SCSI bus problems.	

Problem	What to do
No display messages	Check that the fan in the front of the jukebox is running (or the fan in the rear on the power supply). If the fans are not running, check that the jukebox is receiving power. See "Jukebox won't power on" previously discussed in this troubleshooting list. If the jukebox is not powering on or if the jukebox is powering on but you do not have display messages, call your service representative.
Changed a drive or jukebox ID but the host does not recognize the new ID	• Ensure that no other device IDs conflict with the new ID. If you find a conflict, change the ID and reboot the system (or rescan the bus). (If rebooting, see the note at the bottom of this page.) • Refer to your host adapter documentation for adding devices to a SCSI bus. • Refer to the HP web site at www.hp.com/isgsupport/optical/index.html. • Call your service representative.
Changed a drive or jukebox ID but the jukebox rejected the ID	You are trying to set an ID that is already in use by either the jukebox or by the other drive (in two-drive models). Select another ID.
Forgot your security code	• Enter the default password (`0 0 0`). • If the default password is not accepted, call your service representative.
Disk inserted in the mailslot, `LOAD ERR`, or `MISLOAD` displays	• Press **CANCEL** and re-insert the disk in the mailslot. See "Loading an Optical Disk into the Jukebox" in this chapter for the correct disk loading orientation. • If re-inserting the disk results in the same message, call your service representative.
Before turning power OFF, ensure that the SCSI bus is inactive and will remain inactive while you are troubleshooting. Turning power OFF in this jukebox while the SCSI bus is active can cause data loss and/or SCSI bus problems.	

Problem	What to do
Disk inserted in the mailslot, but `RESERVED` displays	A security configuration is set that prevents disks from being loaded into, or ejected from, the jukebox. If you want to change the security configuration, see "Changing a Jukebox Security Configuration" in this chapter.
Disk eject attempted but `EMPTY` then `READY` displays	This is not an error. There are no disks in the jukebox.
Disk eject attempted but `FULL` then `READY` displays	A disk is in the mailslot. • Remove the disk from the mailslot. • Select EJECT *, select the slot you want the disk ejected from again, and eject the disk.
Disk eject attempted but `MISLOAD` displays	• If there is no disk in the mailslot, press **CANCEL** and attempt another eject. • If MISLOAD continues to display, check the HP web site at www.hp.com/isgsupport/optical/index.html. • If no solution is found, call your service representative.
Disk eject attempted but RESERVED displays	The host computer or application software has reserved the disk for its own use. You will not be able to eject this disk. If you want to change this configuration, refer to the host and/or application software documentation.
You want to stop a running test	Press **CANCEL**. The current test loop continues until finished, then the test stops.

Problem	What to do
INIT ELEM displays	• The jukebox is inventorying the disks and drives. The jukebox or host computer may have initiated this process. Wait for this process to finish. • If this process does not complete, if READY does not appear in the display, or if no motion is seen in the jukebox, power cycle the jukebox. (See the note at the bottom of the table.) • If the jukebox does not come up READY, call your service representative.
Can't write to the disk	• Check the host computer or network file system access permissions. • Check your host computer messages and host system documentation for interpretation of the error messages. • Refer to the HP web site at www.hp.com/isgsupport/optical/index.html. • Call your service representative.
Before turning power OFF, ensure that the SCSI bus is inactive and will remain inactive while you are troubleshooting. Turning power OFF in this jukebox while the SCSI bus is active can cause data loss and/or SCSI bus problems.	

A Supplies and Customer Support

Overview of This Appendix

This appendix provides information on the following topics:

- supplies and accessories
- shipping screw specifications
- HP customer support

Supplies and Accessories

A full range of computer supplies may be ordered through a Hewlett-Packard authorized dealer or sales office, or by phoning or writing HP Direct.

Call 1-800-752-0900 for the location of your nearest authorized Hewlett-Packard dealer.

To contact a Hewlett-Packard sales representative, see Table A-2 for a list of addresses and phone numbers of HP sales offices.

To phone HP Direct call 1-800-538-8787.

To write to HP Direct use the following address:

HP Direct

Hewlett-Packard

P.O. Box 58195

Santa Clara, California 95052

USA

See Table A-1 for a list of basic supplies and accessories.

Table A-1 Basic Supplies and Accessories

Item	HP Part Number
5.2- and 4.7-Gbyte Optical Disks	
Rewritable optical disk (2,048 bytes/sector, 5.2 Gbytes, single disk)	88147J
Rewritable optical disk (2,048 bytes/sector, 5.2 Gbytes, 8-pack)	C6299J
Write-once optical disk (2,048 bytes/sector, 5.2 Gbytes, single disk)	88146J
Write-once optical disk (2,048 bytes/sector, 5.2 Gbytes, 8-pack)	C6298J

Item	HP Part Number
Rewritable optical disk (1,024 bytes/sector, 4.7 Gbytes, single disk)	88143J
Rewritable optical disk (1,024 bytes/sector, 4.7 Gbytes, 8-pack)	C2589J
Write-once optical disk (1,024 bytes/sector, 4.7 Gbytes, single disk)	88145J
Write-once optical disk (1,024 bytes/sector, 4.7 Gbytes, 8-pack)	C2591J
2.6- and 2.3-Gbyte Optical Disks	
Rewritable optical disk (1,024 bytes/sector, 2.6 Gbytes, single disk)	92280F
Rewritable optical disk (1,024 bytes/sector, 2.6 Gbytes, 8-pack)	C2589F
Write-once optical disk (1,024 bytes/sector, 2.6 Gbytes, single disk)	92290F
Write-once optical disk (1,024 bytes/sector, 2.6 Gbytes, 8-pack)	C2591F
Rewritable optical disk (512 bytes/sector, 2.3 Gbytes, single disk)	92279F
Rewritable optical disk (512 bytes/sector, 2.3 Gbytes, 8-pack)	C2588F
Write-once optical disk (512 bytes/sector, 2.3 Gbytes, single disk)	92289F
Write-once optical disk (512 bytes/sector,2.3 Gbytes, 8-pack)	C2590F
SCSI Cables	
50-Pin Low-Density to 50-Pin Low-Density	
0.5 m (1.6 ft) bail to bail, m-m	9222A
1 m (3.3 ft) bail to bail, m-m	9222B

Item	HP Part Number
1 m (3.3 ft) bail to bail, m-f	9222D
2 m (6.6 ft) bail to bail, m-m	9222C
3 m (9.8ft) bail to bail, m-m	C2928A
3 m (9.8 ft) bail to bail, m-f	C2900A
5 m (16.4 ft) bail to bail, m-f	C2901A
10 m (32.8 ft) bail to bail, m-f	C2902A
20 m (65.6 ft) bail to bail, m-f	C2903A
1.5 m (4.9 ft) bail to thumb screw	K2283
50-Pin Low-Density to 50-Pin High-Density	
1.0 m (3.3 ft) bail to thumb screw	K2296
1.5 m (4.9 ft) bail to thumb screw	K2297
68-Pin High-Density to 50-Pin Low-Density	
1.0 (3.3 ft) bail to thumb screw	C2915A
SCSI Terminators	
50-pin active low-density (non-molded)	K2291
50-pin active low-density (molded)	K2290
Disk Cleaners	
RA-2 Manual Disk Cleaner ProDisk Corporation US Tel.(612) 439-6202 Fax (612) 439-5946 (approximately US$30)	N/A
KA-1 Automatic Disk Cleaner ProDisk (see above) (approximately US$559)	N/A
Documentation	
User's Guide (replacement/additional)	C1100-90015

Shipping Screw Specifications

If you have misplaced the shipping screw, you can use a cap screw with these specifications:

6/32 UNC-2B cap screw, 1-3/4 inches long.

Hewlett-Packard Customer Support

If your jukebox fails *during* the warranty period, and the suggestions in this user's guide and accompanying documentation do not solve your problem:

- Consult the Quick FAX or HP FIRST (FAX information Retrieval Support Technology) facsimile assistance services.The phone numbers are under "Faxback Services" on the next page.
- Consult one of the computer/modem connectivity services available, such as America Online or CompuServe. The phone numbers are under "Electronic Support Services" later in this appendix.
- Contact your authorized HP dealer distributor

NOTE

Before calling, please record the following information and have it ready when you contact your service representative:

- model number of your jukebox
- serial number
- brand and model of your host computer
- brand and model of your host computer SCSI adapter
- jukebox application software you are using and its version
- any jukebox driver you may be using that is separate from your jukebox application software and the version of this driver

Should you need additional support, call the Customer Support Center in your region. FAX, electronic services and support center numbers are given on the following pages.

If your jukebox fails *after* the warranty period, contact your authorized HP dealer/distributor or the nearest HP sales and service office. Customers in the US and Europe can use a credit card for phone assistance. For details, see "Telephone Support After Warranty" in this appendix.

Faxback Services

Quick FAX and HP FIRST are automated systems that FAX requested product information and/or technical support documents to you. These faxback services are available 24 hours.

Simply dial the FAX number from a touch tone telephone or Group 3 facsimile machine and follow the voice prompts that guide you to select an index of available support an product documents.

Asia-Pacific	
Australia	(03) 9272 2627
China	(8610)-6505 5280
Hong Kong	2506 2422
India	+91 11 682 6041
Indonesia	(21) 352 2044
Japan	(3) 3335-8622
Korea	(02) 769-0543
Malaysia	(03) 290 2478
Netherlands	0800 22 2420
New Zealand	(09) 356 6642
Singapore	(65) 291-7951
Taiwan	(02) 719 5589
Thailand	(02) 661 3511
Europe	
Austria	0660 8128
Belgium	
Dutch	0800 11906
French	800 17043

Denmark	800 10453
Finland	0800 13134
France	05 905900
Germany	0130 810 061
Italy	1678 59020
Netherlands	06 022 2420
Norway	800 11319
Spain	900 993123
Sweden	020 795743
Switzerland	
German	0800 55 1526
French	0800 55 1527
United Kingdom	0800 960271
Other locations in Europe (toll line)	+31 20 681 5792
North and South America and Canada	(800) 368-9673 or (970) 635-1510
All other countries (to the US)	(970) 635-1510

Electronic Support Services

For 24-hour access to information over your modem, refer to the following listings.

On-line Service Providers

Technical information is available on CompuServe and America Online. (Compuserve and America Online are not operated by Hewlett-Packard.)

CompuServe	HP systems Forum, Go HPSYS
America Online	HP forum, Go HPSTOR

AccessHP and Support on the World Wide Web

Product and support information is available on the Hewlett-Packard web site:

Product information - www.hp.com
Support - www.hp.com/isgsupport/optical/index.html

Telephone Support During Warranty

To speak with someone for technical assistance within the hardware warranty of your product, call a support representative at the location appropriate to your location as listed below.

NOTE

Before calling, please record the following information and have it ready when you contact your support center representative:

- model number of your jukebox
- serial number
- brand and model of your host computer
- brand and model of your host computer SCSI adapter
- jukebox application software you are using and its version
- any jukebox driver you may be using that is separate from your jukebox application software and the version of this driver

US - America's Customer Support Center

Monday - Friday, 7am - 5pm Mountain Time (970) 635-1000

Europe - European Customer Support Center

Monday - Friday, 8:30am - 5pm Netherlands Time

Austria	0660 6386	Germany	0180 5 25 81 43
Belgium		Netherland	020 606 8751
Dutch	02 626 8806	Norway	22 11 6299
French	02 626 8807	Portugal	01 441 7199
Denmark	3929 4099	Spain	902 321 123
Finland	0203 47288	Sweden	08 619 2170
France	04 50 43 9853	Switzerland	0848 80 11 11
Ireland	01 622 5525	United Kingdom	0171 512 5202
Italy	02 26410350		

English language support from other European countries:

+44 171 512 5202

Asia-Pacific - HP Customer Support Center

Australia	8:30 - 17:30 Mon-Fri	(03) 9272-8000
China	8:30 - 17:30 Mon-Fri	(8610) 62625666 x5602, 5609, 5611, 5612 (8610) 62 61 4174 (8610) 62 61 4175 (8610) 62 61 4176
Japan	9:00 - 1200 13:00 - 17:00 Mon-Fri	(3) 3335-8338
Korea	8:30 - 1900 Mon-Fri	(02) 3270-0700/ 080-999-0700 (toll free)

New Zealand	8:30 - 16:00 Wed AEST	(09) 356-6640
Singapore	9:00 - 17:00 Mon - Fri	(65) 271-7233
Taiwan	8:30 - 17:30 Mon - Fri	(02)717-9609

Elsewhere in the World to the US

Contact your authorized HP dealer/distributor or the nearest HP sales and service office.

Telephone Support After Warranty

NOTE

Before calling, please record the following information and have it ready when you contact your support center representative:

- model number of your jukebox
- serial number
- brand and model of your host computer
- brand and model of your host computer SCSI adapter
- jukebox application software you are using and its version
- any jukebox driver you may be using that is separate from your jukebox application software and the version of this driver

North and South America and Canada

Using your VISA, MasterCard, or American Express call:

(800) 810-0130 - Per incident fee of $25.00 charged to your credit card.

(900) 555-1800 - $2.50 per minute up to a maximum of $25.00 per incident. You must be 18 years of age or have parental permission to call this number.

Prices are subject to change without notice.

Europe

Call the numbers listed in the “Telephone Support Under Warranty” section. A per incident fee will be charged for after warranty support. Please have a credit card, PO number, or billing address ready.

Elsewhere in the World

Contact your authorized HP dealer/distributor or the nearest HP sales and service office.

Additional Telephone Support

Singapore Customer Care-Line for End-Users	(65) 272-5300

HP Reseller Locator Numbers

US	(800) 752-0900
Canada	(800) 387-3867
Mexico and South America	(305) 267-4220

Warranty

HP PRODUCT	DURATION OF WARRANTY
C1100J / C1115J	One Year

1. HP warrants HP hardware, accessories and supplies against defects in materials and workmanship for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.

2. HP warrants that HP software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.

3. HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.

4. HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

5. The warranty period begins on the date of delivery or on the date of installation if installed by HP. If customer schedules or delays HP installation more than 30 days after delivery, warranty begins on the 31st day from delivery.

6. Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.

7. TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY OR CONDITION, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

8. HP will be liable for damage to tangible property per incident up to the greater of $300,000 or the actual amount paid for the product that is the subject of the claim, and for damages for bodily injury or death, to the extent that all such damages are determined by a court of competent jurisdiction to have been directly caused by a defective HP product.

9. TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

B Operating This Jukebox on a SCSI Bus

A Brief Overview of SCSI

General

The Small Computer System Interface (SCSI), is a contention-based bus that accommodates different speed devices without impacting the devices with faster transfer speeds. This specification was defined by the American National Standards Institute (ANSI) in 1986. The specification defines both the physical medium and the command set used to transfer information. Later developments are known under the newer specifications, SCSI-2 and SCSI-3.

The SCSI Bus

The common SCSI buses are 50-pin and 68-pin. The 50-pin bus, which uses eight of its lines for data transmission, is called a "narrow" bus. The narrow bus can support eight devices. The 68-pin bus, which uses 16 lines for data transmission is called a "wide" bus. The wide bus can support 16 devices.

Initiators and Targets

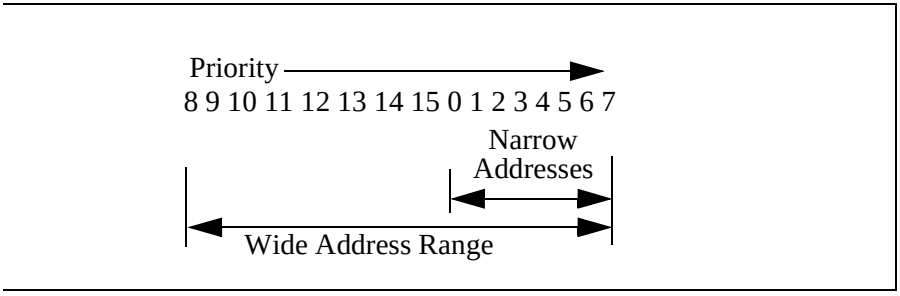
SCSI devices on the bus are either “initiators” or “targets.” An initiator (usually the host computer) originates a transaction and the target (usually a peripheral device) fulfills the request.

Initiators and targets identify themselves on the bus by a SCSI ID. The ID is designated by the user and is set electronically or manually depending on the device. In addition to identifying a device on the bus, the ID also determines the priority of the device during contention among the devices for use of the bus.

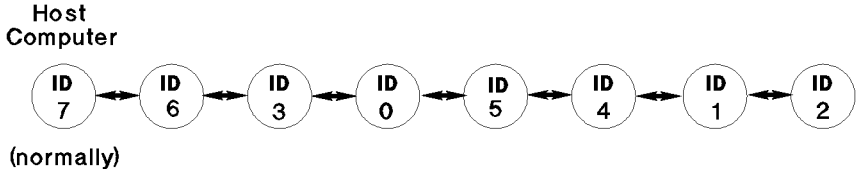
The narrow SCSI bus, with its eight data lines, can communicate with eight devices that have IDs from 0 to 7. The wide SCSI bus, with its 16 data lines, can communicate with 16 devices that have addresses from 0 to 15. The host adapter, which links the host computer to the SCSI bus, is also a SCSI device (initiator), and is usually assigned an ID of 7.

Priority of IDs ascends from lowest to highest but this ascending priority, however, is in blocks of eight IDs, and the block from 8 to 15 is actually defined to be at a lower priority than ID 0, the lowest address on the "narrow" portion of the bus. This is done so that if a narrow device is placed on a wide bus, the wide devices, which can "see" the lower addresses, will always defer to the lower addresses when they contend for the bus. Otherwise, a narrow device, which cannot "see" any device at

an ID greater than 7, would always assume it won the contention and would attempt to talk, perhaps at the same time as a device with an ID above 7 that was contending for the bus. The following diagram shows the priority scale of IDs when the priority of the two blocks of eight are reversed.



The diagram below shows the linear addressing of a simple, narrow bus with the host adapter set at a SCSI ID of 7. The device ID does not determine where the device is physically placed on the bus.



LUN Addressing

This jukebox does not support logical unit numbering (LUN) addressing.

Transfer Rates on the Bus

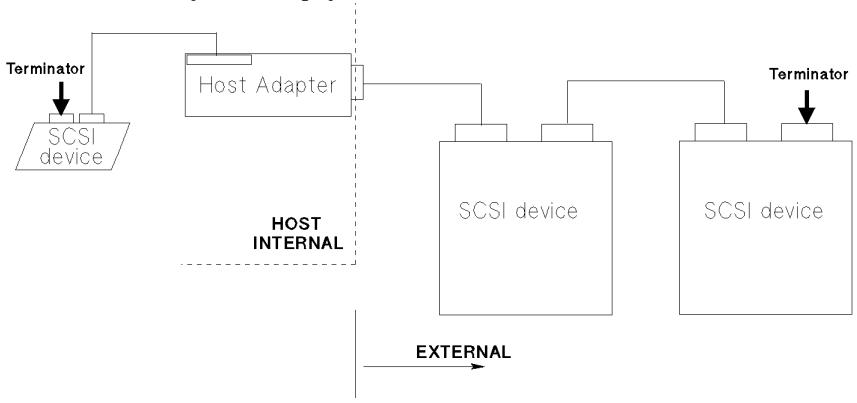
Initially, the SCSI specification defined a 5 MB/s synchronous data transfer rate on the narrow bus. SCSI now also defines "Fast" which is 10 MB/s on a narrow bus and 20 MB/s on a wide bus. Another definition is "Ultra," also known as "Fast-20" which is 20 MB/s transfer rate on a narrow bus and 40 MB/s on a wide bus.

Termination

To keep signals on the SCSI bus from being reflected, “terminators” must be placed at each end of the physical bus. These terminators may be either active or passive. Passive termination is a resistor network. Active termination uses a voltage regulator (the active component) to regulate the power of the resistor network to provide more stable termination. Active termination is always preferred over passive termination.

Depending on your SCSI device, termination is supplied by a using a physical connector, by flipping a dipswitch, or by selecting the termination setting in software.

Termination is always at both physical ends of the bus.



Single-ended and Differential Interfaces

The SCSI bus is electrically implemented in two ways: single-ended and differential. These terms come from the way the signals are asserted on the bus. Single-ended buses use a 5-volt signal that is referenced to ground. This method makes the bus somewhat susceptible to noise and loss of signal quality over distance. The maximum allowable length of a single-ended SCSI bus was initially 6 meters (19.7 feet). Fast SCSI required the maximum length of the bus to be reduced to 3 meters (9.8 feet).

The differential bus uses two lines for each signal and measures the voltage difference between the two signals. Differential retains more signal quality than single-ended and is not as sensitive to noise, allowing for a longer cable length. The maximum allowable length of a differential bus is 25 meters (82 feet) for all types buses (narrow, wide, fast, Fast-20).

Connectors

Narrow devices (50-pin) use the following connectors:

- 50-pin low-density clip Centronics-type (external)

  This is a large connector that is similar to a printer cable. This type of connector is gradually being replaced by the Micro D connector, described below.

- 50-pin high density Micro D (using thumbscrews or small clips) (external)
- This connector is similar to a D-type connector, but smaller and with smaller pin holes placed closer together.
- 50-pin low-density ribbon (usually internal to the host)

Wide devices (68- pin) use the following connectors:

- 68-pin high density Micro D connector (external)

  This connector is similar to a D-type connector, but longer and slimmer and with smaller pin holes placed closer together. This connector is becoming the most common.

- 68-pin high density ribbon (usually internal to the host)

NOTE

For more complete information on the theory and operation of the SCSI bus, you may want to go to:

Adaptec - major supplier in SCSI buses
www.adaptec.com
Symbios Logic - Working drafts of SCSI specifications
www.symbios.com/x3t10

The SCSI Bus and This Jukebox

This jukebox is a “fast and narrow” SCSI device that uses a single-ended SCSI bus. This jukebox does not support logical unit number (LUN) addressing.

When considering adding other peripherals to the jukebox bus, you should consider the following:

- Will adding a device onto a bus with this jukebox interfere or degrade the performance of the jukebox or the device that is added?
- If the decision is made to add other devices to the jukebox bus, what SCSI requirements must be observed to make sure the bus will work?

Before addressing some questions involved in deciding whether to place another device on the jukebox bus, we can say that, as a general rule, HP recommends that the jukebox be the only device on a bus. The more devices on the bus, the more chance for problems. Performance of one or all of the devices on the bus can be affected.

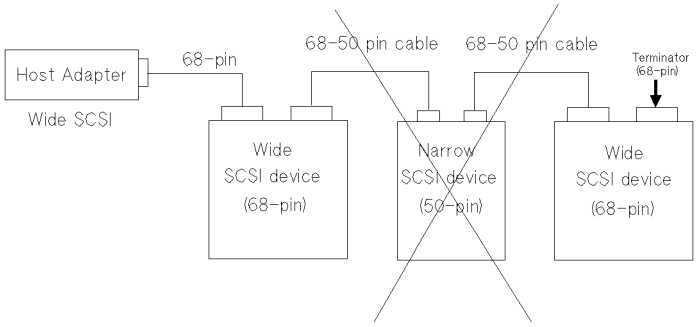
If you are still considering adding a device, you might first consider the quantity of data that the bus will have to carry, the frequency of data transfer, and the priority of this data transfer in your business. If you are using the jukebox as a backup or archive device, the demands on the jukebox will be different than if the jukebox is used for near-online storage where requests are more random in both frequency and data size. If you expect to be using the jukebox in the same time-frame as the other device, or devices, this might indicate that you may experience a drop in performance.

Mixing Wide and Narrow Devices

An a preliminary note to this discussion, HP highly recommends that you do NOT mix wide and narrow buses.

Connecting devices of the same bus width, such as all narrow (50-pin) is a simple process of daisy-chaining the devices, and terminating both ends of the bus. However, mixing narrow and wide devices invites problems.

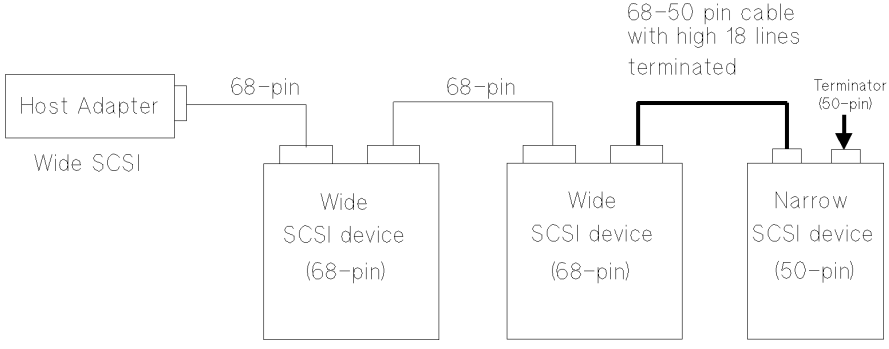
This method should only be implemented by an experienced systems integrator who is highly knowledgeable about SCSI. Since the wide (68-pin) buses need more data lines on the bus for their data transfer, it's necessary that the cables connecting the devices are 68 pin. The data would be lost if the devices were set up as depicted in the figure below.



Because a narrow device only has a 50-pin connector, it will not transmit the eight extra bits of data needed for the wide device on the end of the bus. Using only 50 lines also prevents the narrow device from passing along the IDs of devices at 8 or above.

The lower eight data lines transfer commands and messages, allowing all devices, regardless of size, to co-exist on the bus. However, data transfers and device addressing occur on the higher bits. Since a narrow device can't "see" the upper 8 data bits, that translates to it not being able to "see" wide devices with a SCSI ID above 8. Remember the host adapter is a device, so if you're mixing wide and narrow devices on the bus, your host adapter must be at an ID that all devices can address.

If mixing narrow and wide devices is unavoidable, use the configuration described below:



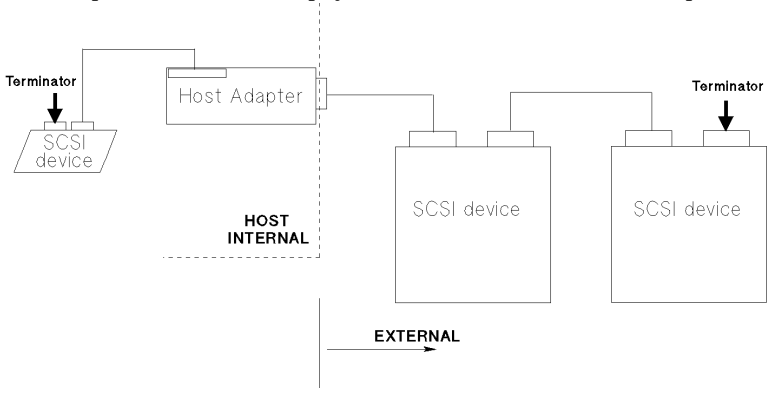
It is very important that the 68-pin to 50-pin cable is properly configured to assure that the eighteen truncated lines are properly terminated.

Cable Lengths

This jukebox uses a single-ended bus. The maximum bus length for this "fast" device on a single-ended bus is 3 meters (9.8 feet). The internal cable length of the jukebox is 1.5 meters (4.9 feet) which leaves 1.5 meters (4.9 feet) for the rest of the bus.

Termination

- Refer to the documentation that comes with your particular adapter to see how to apply termination.
- Use active terminators to reduce noise sensitivity.
- Never terminate the bus at any place except the physical ends. Terminating the bus in the middle will probably cause the bus to become inoperable or operate in a state that could cause data loss.
- If devices are on both sides of the host computer adapter (such as hard drives internal to the host computer and a jukebox external to the host computer) make sure that there is no termination on the host computer adapter. Termination must be only on the device inside the computer that is farthest away (on the bus) from the host adapter, and on the last physical device external to the computer.



General

- Do not connect a single-ended bus to a differential bus. Damage can occur.

NOTE

For current information on issues relating to installation, operation, and support of jukeboxes, you may want to go to:

HP Optical Storage
www.hp.com/isgsupport/optical/index.html

C Safety and Regulatory Information

Overview of this Appendix

This appendix contains important safety and regulatory information for the United States, Finland, Sweden, Germany, United Kingdom, European Union, and Japan.

CDRH Regulations (USA Only)

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The labels and artwork shown below indicate compliance with CDRH regulations and must be attached to laser products marketed in the United States.

WARNING **Use of controls, adjustments or performing procedures other than those specified in this manual may result in hazardous laser radiation exposure.**

NOTE Complies with 21 CFR Chapter 1 Subchapter J.

Laser Class Information: A black on yellow label which reads, "Class 1 Laser Product" printed in English, French, German, Finnish, Japanese, and Spanish.

United Kingdom Telecommunications Act 1984

The HP SureStore Optical 80ex jukeboxe is approved under Approval Number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems within the United Kingdom.

EC Declaration of Conformity

Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Co.

Manufacturer's Address: Storage Systems Division
700 71st Avenue
Greeley, CO 80634 USA

declares, that the product

Product Name: Optical Disk Library

Model Numbers: C1100x, C1101x, C1102x, C1103x, C1115x, C1116x
(Where x = any alpha all w or w/o suffixes)

Product Options: All Options

conforms to the following Product Specifications:

Safety: EN 60950: 1992+A1+A2:1993+A3:1995/IEC950(1991)+A1+A2+A3
EN 60825-1 (1994) / IEC825-1 (1993), Laser Class 1

EMC: EN 55022 (1994) / CISPR 22 (1993), Class B
EN 50082-1 (1992)
prEN 55024-2 (1992) / IEC 1000-4-2 (1995), 4 kV CD, 8 kV AD
prEN 55024-3 (1991) / IEC 1000-4-3 (1995), 3 V/m
prEN 55024-4 (1993) / IEC 801-4-4 (1988), 1 kV Peak Power Lines
0,5 kV Signal Lines
EN 61000-3-2 (1995) / IEC 1000-3-2 (1995), Harmonics
EN 61000-3-3 (1995) / IEC 1000-3-3 (1994), Flicker

Supplementary Information:

The product herewith complies with the requirements of the following Directives and carries the CE marking accordingly: the EMC Directive 89/336/EEC -the Low Voltage Directive 73/23/EEC (including 93/68EEC)

The Manufacturer listed above declares that this product has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: a) Reorient or relocate the receiving antenna, b) Increase the separation between the equipment and receiver, c) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected, or d) Consult the dealer or an experienced radio/TV technician for help.

Change or modification of this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate this equipment. Only use the cables, connectors, power cords, and accessories supplied with this equipment or expressly approved by Hewlett-Packard.

Storage Systems Division March, 1998 Greeley, Colorado, USA

For Regulatory Compliance Information ONLY, contact:

Australian: Product Regulations Manager, Hewlett-Packard, Australia Ltd., 31-41 Joseph Street, Blackburn, Victoria 3130, Australia

European: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Strasse 130, D-71304 Boblingen (FAX:+49-7031-14 3143

USA: Product Regulations Manager, Hewlett-Packard Company, 700 71st Avenue, Greeley, CO 80634 USA, (Phone: 970-350-5600).

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlärn information sverordnung vom 18 Januar 1991.

Schalldruckpegel Lp < 70 dB(A)

- am arbeitsplatz
- normaler betrieb
- nach ISO 7779:1988/EN 27779:1991 (Typprüfung)

English Translation of German Sound Emission Directive

This statement is provided to comply with the requirements of the German Sound Emission Directive, from 18 January 1991.

Sound pressure Lp < 70 dB(A)

- at operator position
- normal operation
- according to ISO 7779: 1988/EN 27779: 1991 (type test)

Turvallisuusyhteenveto

Laserturvallisuus

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP SureStore Optical 80ex optiset levymuistiasemat ovat käyttäjän kannalta turvallisia luokan 1 laserlaitteita. Normaalissa käytössä levymuistiaseman kotelointi estää lasersäteen pääsyn laitteen ulkopuolelle.

Laitteen turvallisuusluokka on määritetty standardin EN 60825 mukaisesti.

VAROITUS !

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle lasersäteilylle.

VARNING !

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för laserstrålning, som överskrider gränsen för laserklass 1.

Huolto

HP SureStore Optical 80ex levymuistiasemien sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Levymuistiaseman sisälle asennettujen luku-/kirjoitusyksiköiden suojakoteloa ei tule avata huoltotoimenpiteiden yhteydessä.

VARO !

Mikäli luku-/kirjoitusyksikön suojakotelo avataan ja suojalukitus ohitetaan, olet alttiina lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

VARNING !

Om skyddshöljet av den optiska drivmodulen öppnas och spärren urkopplas då apparaten är i funktion, utsättas användaren för laserstrålning. Betrakta ej strålen.

Tiedot luku-/kirjoitusyksikössä käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus	680 nm
Teho	60 mW
Turvallisuusluokka	3B

English Translation of Finland Regulatory Information

LASER SAFETY SUMMARY

LASER SAFETY

CLASS 1 LASER PRODUCT (The same in Swedish.)

HP SureStore Optical 80ex jukebox is for user safe class 1 laser products. In normal use the enclosure of the optical drives prevents the laser beam from escaping outside of the product.

The jukebox was type approved in Finland for laser safety by the National Board of Labour Protection. The safety class of the products was defined according to the resolution No 472/1985 of the Council of State and the standard EN 60825.

WARNING !

The use of the product otherwise than specified in the user's manual may expose the user to laser radiation exceeding safety class 1.

(The same warning in Swedish.)

SERVICE

There are no user serviceable parts inside the jukebox. The jukebox products can be serviced only by qualified service personnel. The optical drive mechanism(s) installed inside the library system shall not be opened or disassembled during service.

WARNING !

If the enclosure of the optical drive mechanism is opened and the safety interlock disabled, you may be exposed to the laser radiation when the drive is operating. Avoid exposure to the beam.

(The same warning in Swedish.)

The information about the radiation characteristics of the laser diode used in the optical drive mechanism:

Wavelength	680 nm
Power	60 mW
Class	3B laser

Japanese VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると受信障害を引き起こすことがあります。
取り扱い説明書に従って正しい取り扱いをして下さい。

This equipment is in the Class B category information technology equipment based on the rules of Voluntary Control Council For Interference by Information Technology Equipment (VCCI). Although aimed for residential area operation, radio interference may be caused when used near a radio or TV receiver. Read the instructions for correct operation.

Glossary

C-D

cartridge A plastic enclosure that contains an optical disk. The cartridge is labeled "A" or "B" to denote separate sides of the optical disk. The optical disk is never removed from the cartridge.

disk See optical disk.

driver A program that allows the operating system to communicate with a peripheral device.

E-L

element A SCSI term for any one of the autochanger components — drive, mailslot, storage slots, or picker.

front panel The part of the jukebox that includes a control panel used to manage and display functions, and a mailslot to insert and remove disks.

jukebox A term synonymous with optical disk library or autochanger. This type of optical storage device is often referred to as a “jukebox” because when a file is requested, the disk containing the file is found, inserted into the drive, and the requested information is sent to the host computer system, similar to the way a musical jukebox finds a record and moves it to the turntable when a song is requested.

jukebox controller The part of the jukebox that controls the sending and receiving of SCSI commands and controls the disk transport mechanism.

LAN Local area network. A group of computers and peripherals physically connected so users can share hardware and software resources.

M-O

magneto-optical A type of optical technology which uses a laser to read from and write to a magnetic layer on an optical disk. To write, a spot on the magnetic layer is heated by a laser to a point where it can be magnetically altered by the write magnetic head. To read, a light from the laser is reflected from the spot. The magnetic alteration causes the reflected light to be polarized in one direction (interpreted as a "1") or the opposite direction (interpreted as a "0").

mailslot The area where disks are inserted and removed from the jukebox.

multifunction drive An optical disk drive that supports both rewritable and write-once optical disks. The drive detects the disk type by reading a

factory-stamped code on the disk, and automatically determines whether to operate in rewritable or write-once mode.

optical disk A term synonymous with the 5.25-inch magneto-optical disk. There are two types of optical disks used in jukeboxes: rewritable and write-once.

optical disk library See jukebox.

R-T

rear panel The rear panel of the jukebox provides a single-ended SCSI connection and power connection.

rewritable optical An optical disk technology in which data can be repeatedly written using magneto-optical reading and writing technology.

SCSI An acronym for the Small Computer Systems Interface.

storage slot An are of the autochanger that holds cartridges when the cartridges are not in a drive or not being ejected through the mailslot.

terminator A resistor array device used for electrically terminating a SCSI bus. A SCSI bus must be terminated at its two physical ends. A peripheral device uses a terminator only if it is at the end of the bus.

W

write-once An additional operating mode available with multifunction drives. When a write-once disk is inserted, the drive will write data, but will not write over data that has been previously written. This feature is useful for applications that need permanent data security and audit trails.

write protect A feature that prevents data from being written to a disk. A write protect tab is located on both sides of the optical disk cartridge to enable write-protection on one or both surfaces of the disk.

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